Requirements Reviews Revisited
- Residual Challenges and open Research Questions -

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2013 RE

Agenda

- Context

- Theory vs. Practice

- Root Causes

- Five Major Challenges

- Summary

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- **Context**
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Context

Requirements reviews in...

- small to large projects
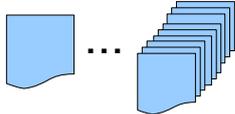
- custom (bespoke) software development

- use cases, interfaces, non-functionals...
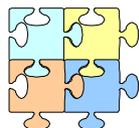
NOT:

- safety-critical and packaged based solutions

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Theory

Exponentially increasing error correction costs:

	Analysis	Design	Coding	Unit test	UAT	Field
Relative number of occurring errors	10%	40%	50%			
Relative number of detected errors	3%	5%	7%	25%	50%	10%
Costs per corrected error (€)	250	250	250	1,000	3,000	12,500
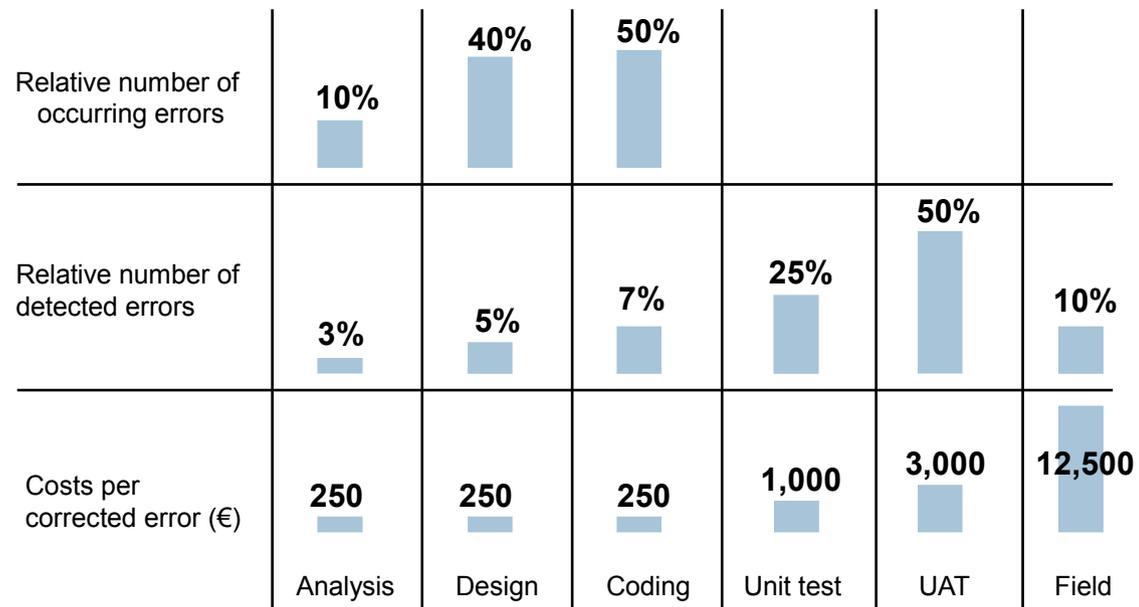
Source: Liggesmeyer: *Software-Qualität*

**Find errors early
One tool: Reviews**

Practice

„No time!"

„Cost/Benefit-Ratio?"

„My project is special!"

„Don't want to!"

Reviews are not systematically leveraged

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Root Causes?
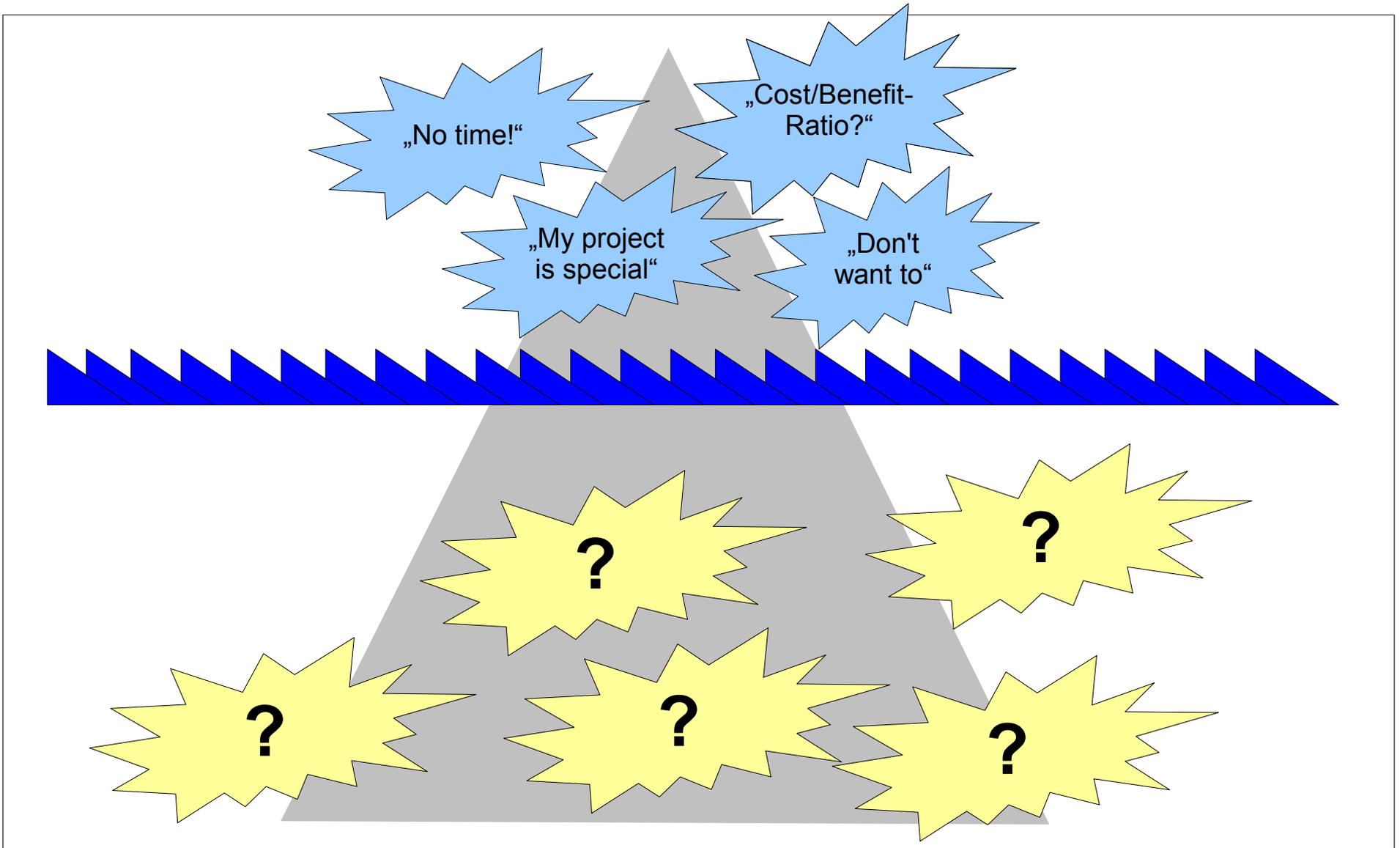
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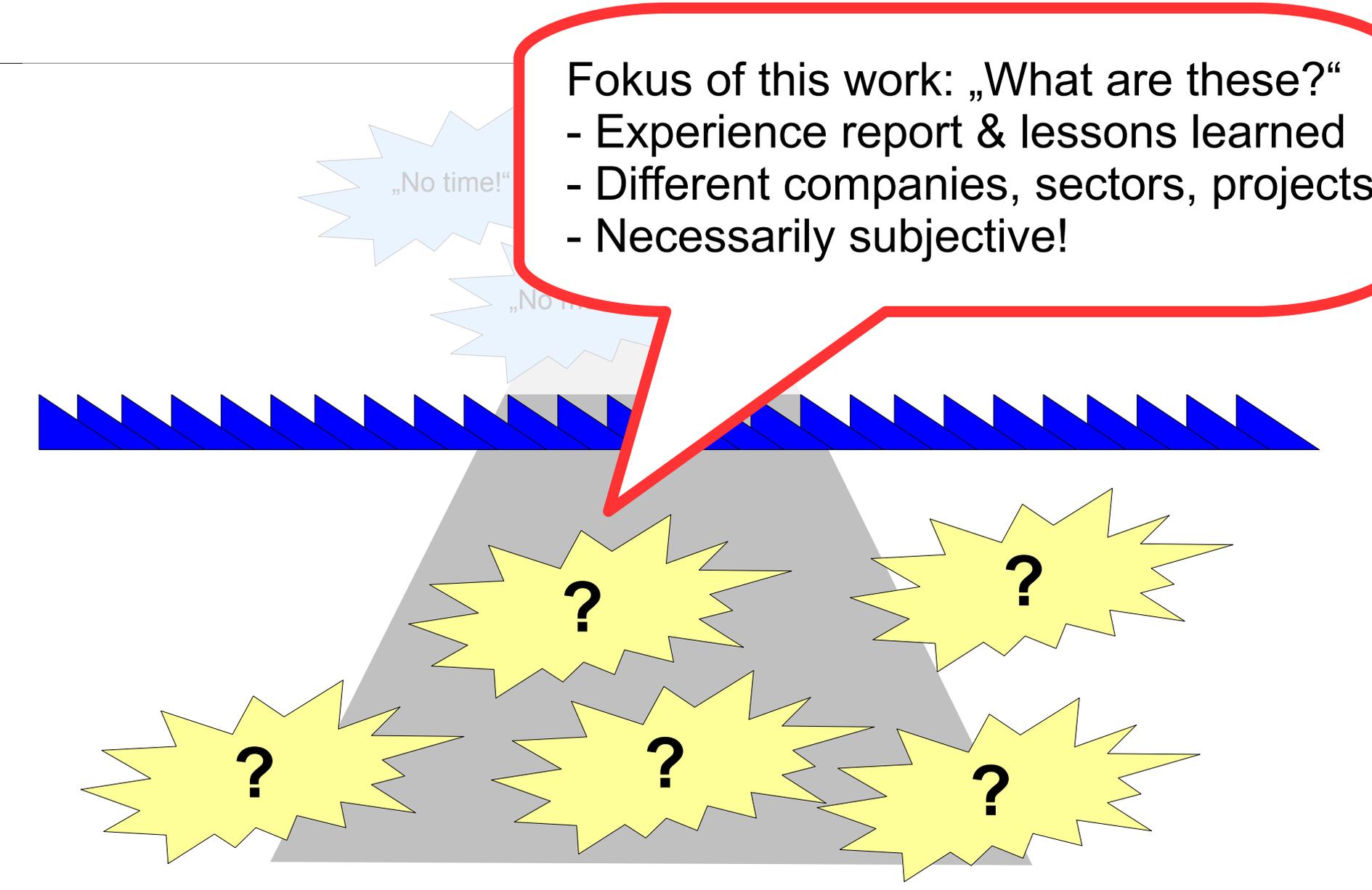
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Five Major Challenges

1 Flawed 'upstream' requirements

2 Sociological impact undererstimated

3 Reviews not effective on all q-attributes

4 Goal of applying reviews not made clear

5 I&I* development poses specific prob's

* Iterative & Incremental

1 Flawed 'upstream' requirements
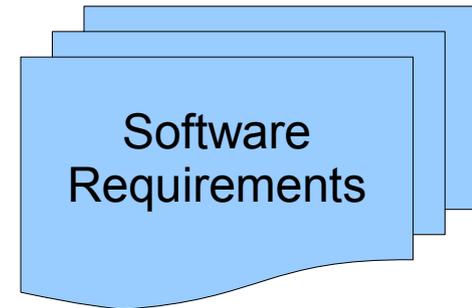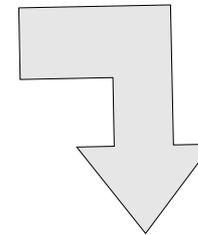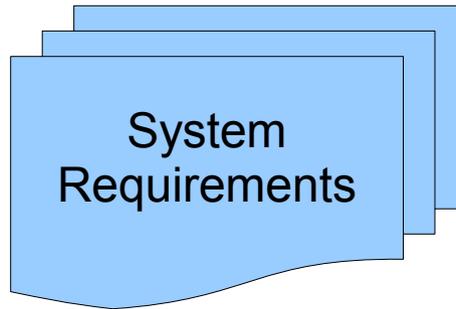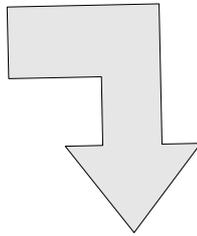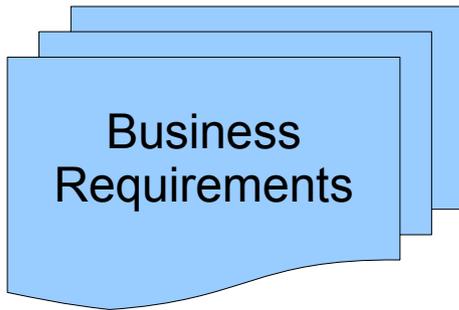
Business
Requirements

System
Requirements

Software
Requirements

1 Flawed 'upstream' requirements

Business Requirements

Omissions
Ambiguities

Errors
Omissions
Ambiguities

System Requirements

Omissions
Ambiguities

Errors
Omissions
Ambiguities

Software Requirements
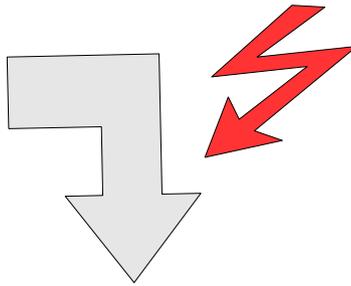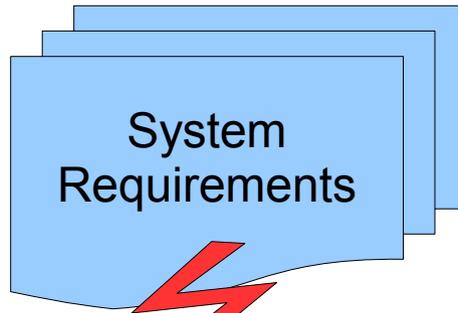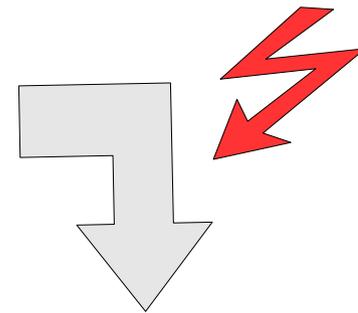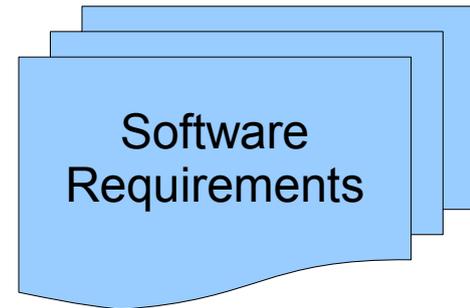
1 Flawed 'upstream' requirements

Business
Requirements

Possible solutions:

→ Clearly define the underling problem or goal!
→ Start to apply reviews already here!
→ Check systematic allocation of BRs!

1 Flawed 'upstream' requirements

Business Requirements

Potential research questions:

→ „How can BRs be reviewed in the first place?"

→ „What are relevant q-attributes of BRs?"

2 Sociological impacts underestimated

Missing management
'Buy In'

Wrong 'culture'

Personal agendas

2 Sociological impacts underestimated

management

Possible solutions:

→ Take sociological impact of reviews really serious!

→ Try to figure out the needs and expectations of the roles involved

2 Sociological impacts underestimated

management

Potential research questions:

→ „How to categorize sociological aspects in requirements reviews?"

→ „How to tackle these aspects in a stringent manner?"

→ „What results would a systematic literature review yield?"

Reviews are not effective on all q-attributes

Quality of Requirements Specification

Traceability

Correctness

Completeness

Others...

Quality of Requirements Specification

Traceability

Correctness
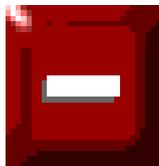
Completeness

Others...

3 Reviews are not effective on all q-attributes

uality of

Possible solutions:

→ Accept and communicate the limitations and blind spots of reviews on requirements specifications!

→ Ensure conformance to these q-attributes by emploing suitable 'constructive' quality assurance techniques (e.g., prototyping')

3 Reviews are not effective on all q-attributes

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Potential research questions:

→ „Where exactly are the limitations and blind spots of reviews in requirements specifications?"

→ „Are 'traditional q-attributes' still applicable in modern development approaches?"

The Goal of Applying Reviews is not Clear

„Review goal landscape" *)

Inspection

Collect software engineering data

find anomalies

Verify quality attributes

Check conformance to specifications and standards

Train participants

Check proper implementation of changes

Examin alternatives

Walk-Through

Technical Review

* NB: Incomplete and only illustrates authors subjective view

4 The Goal of Applying Reviews is not Clear

„R........oal landscape" *)

Possible solutions:

→ Clearly define the goals that are
    pursued by implementing reviews

* NB: Incomplete and only illustrates authors subjective view

4 The Goal of Applying Reviews is not Clear

„R... oal landscape" *)

Potential research questions:

→ „How could we comprehensively categorize different review and inspection approaches?"

→ „How can we distinguish and caracterize different approaches according to different review goals?"
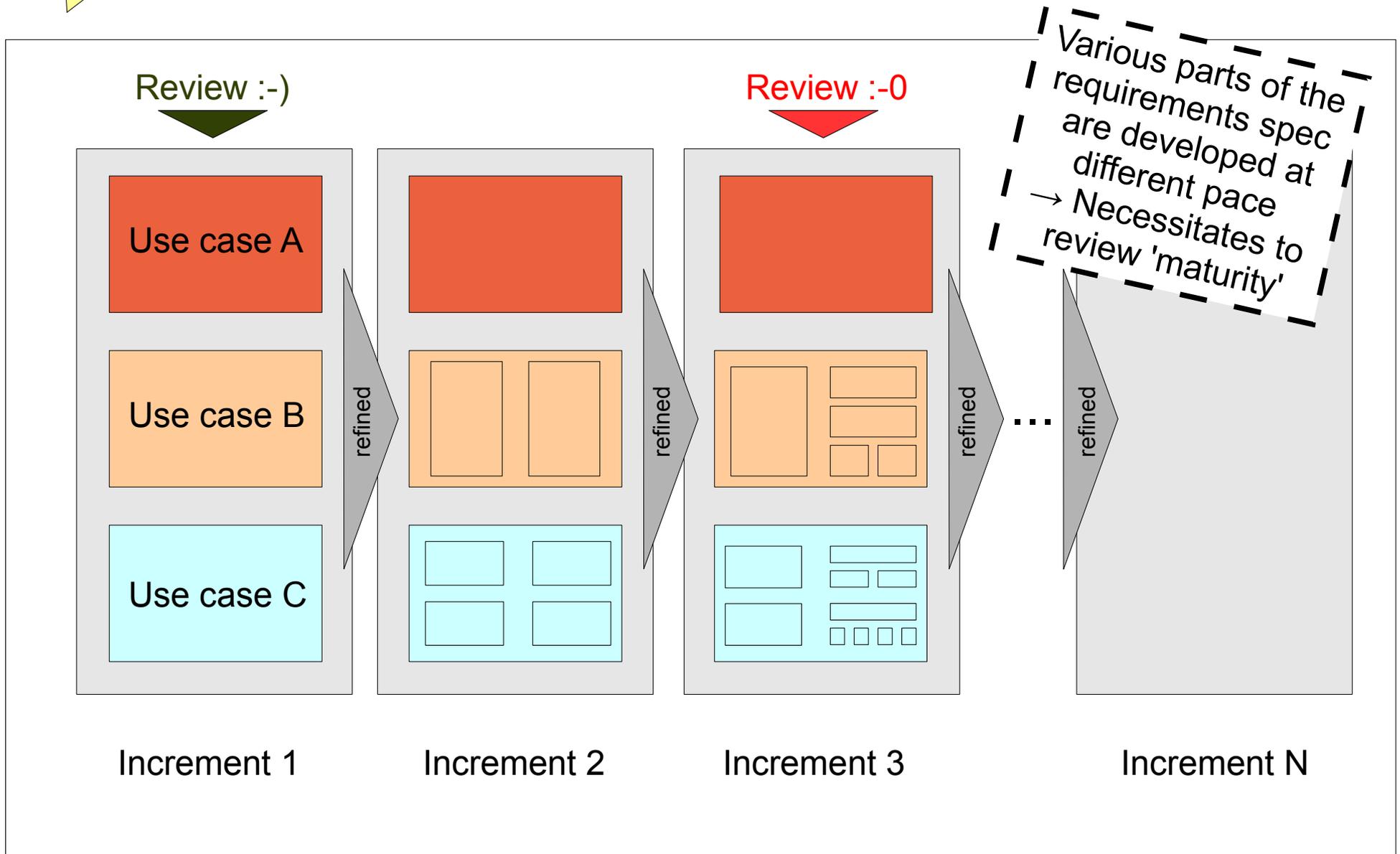
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5 I&I* development poses specific prob's

Review :-)

Review :-0

Various parts of the requirements spec are developed at different pace → Necessitates to review 'maturity'

Use case A

Use case B

Use case C

refined

refined

...

refined

refined

Increment 1

Increment 2

Increment 3

Increment N

* Iterative & Incremental

I&I* development poses specific prob's

Various parts of the requirements spec are developed at different...

Possible solutions: None?!

But have a look at:
Leffingwell, D., Wirding, D., "Managing Software Requirements – A Use Case Approach", Addison-Wesley Pearson Education, 2003

5 I&I* development poses specific prob's

Various parts of the requirements spec are developed at different...

Potential research questions:

→ "How can maturity levels be defined for different requirement models?"
→ "What is the relationship between maturity levels of requirements and earned value analysis?"
→ "How could a 'maturity level' approach be defined in a way that is workable in the industrial practice?"

* Iterative & Incremental

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Summary

Contribution of this Paper

1	Flawed 'upstream' requirements
2	Sociological impact undererstimated
3	Reviews not effective on all q-attributes
4	Goal of applying reviews not made clear
5	I&I* development poses specific prob's

Possible solutions

Open research questions

Future Research

A need for a more interdisciplinary approach to requirements engineering reviews

Thanks!

→ Questions?

Backup

World champion 2014? The meaning of 42? Star Wars VII? … Relevant Questions!!!
But even more interesting: Open Research Questions of Requirements Reviews ;-)
→ Please visit the talk „**Requirements Reviews Revisited**" to learn more!